

**EPA Superfund  
Record of Decision:**

**NATIONAL ELECTRIC COIL CO./COOPER  
INDUSTRIES  
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DAYHOIT, KY  
09/30/1992**

**NATIONAL ELECTRIC COIL CO./COOPER INDUSTRIES SUPERFUND SITE**

**RECORD OF DECISION**

SEPTEMBER 30, 1992

RECORD OF DECISION

NATIONAL ELECTRIC COIL CO./COOPER INDUSTRIES SITE

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## **RECORD OF DECISION**

### **THE DECLARATION**

#### **SITE NAME AND LOCATION**

National Electric Coil Co./Cooper Industries Site  
Dayhoit, Harlan County, Kentucky

#### **STATEMENT OF BASIS AND PURPOSE**

This decision document presents the selected "interim" remedial action for the National Electric Coil Co./Cooper Industries Site, in Dayhoit, Harlan County, Kentucky, which was chosen in accordance with CERCLA, as amended, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record for this site. The Commonwealth of Kentucky concurs with the selected remedy.

#### **ASSESSMENT OF THE SITE**

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

#### **DESCRIPTION OF THE SELECTED REMEDY**

This "interim" remedial action employs the use of an extraction well/air stripper system in order to prevent further ground-water plume migration in the bedrock aquifer, which is one of two distinct aquifers beneath the Site, and to initiate ground-water restoration while the RI/FS and post-RI/FS activities are being completed. The bedrock aquifer beneath and immediately downgradient of the Site (up to an estimated extent of one-half mile) contains volatile organic compound (VOC) contamination.

The components of the Selected Remedy are as follows:

- . Extraction of contaminated bedrock aquifer ground water;
- . Treatment of contaminated ground water using air stripper tower;
- . Discharge of treated ground water to Cumberland River via KPDES requirements;
- @ Emission controls on air stream leaving air stripper tower.

## **STATUTORY DETERMINATION**

The "interim" remedial action is protective of human health and the environment in the short term and is intended to provide adequate protection until a final ROD is signed. It complies with Federal and state applicable or relevant and appropriate requirements for this limited-scope action, and is cost-effective. Although this "interim" action is not intended to address fully the statutory mandate for permanence and treatment to the maximum extent practicable, this "interim" action does utilize treatment and thus is in furtherance of that statutory mandate. Because this action does not constitute the final remedy for the Site, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principle element, although partially addressed in this remedy, will be addressed by the final response action. Subsequent actions are planned to address fully the threats posed by conditions at this site. Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment within five years after commencement of the final remedial action. Because this is an "interim" action ROD, review of this site and of this remedy will be ongoing as EPA continues to develop final remedial alternatives for the Site.

## **DECISION SUMMARY**

### **1.0 SITE NAME, LOCATION, AND DESCRIPTION**

#### 1.1 Site Location

The National Electric Coil Co./Cooper Industries Superfund Site (NEC or Site) is located on Old U.S. Route 119 adjacent to the Cumberland River in the town of Dayhoit, Harlan County, Kentucky (Figure 1.1). The Site includes the 3.5 acre National Electric Services manufacturing facility, which is currently operating, and also encompasses the areal locations to which hazardous constituents might have migrated from the Site (Figure 1.2).

#### 1.2 Affected Population

The Dayhoit community is located downriver of the Site. Approximately 350 people live in Dayhoit. Approximately 40 families reside at the Holiday Mobile Home Park within close proximity to the Site.

#### 1.3 Topography

The NEC site is located in the flood plain of the Cumberland River in Harlan County, Kentucky. The Site is relatively flat except along the riverbank area, which slopes steeply down to the Cumberland River. The topography of the area near the Site consists of northeast-trending ridges of the Pine and Cumberland Mountain and the bottomland associated with the Cumberland River and its tributaries.

#### 1.4 Adjacent Land Uses

The facility property is bordered on the south by the Holiday Mobile Home Park, on the north by the Kentucky Utility Company where a substation is located, on the east by the Cumberland River, and on west by Old Highway 119. The property is fenced on all sides.

#### 1.5 Geology

Harlan County, Kentucky is located in the Cumberland Mountain section of the Eastern Coalfields Region of Kentucky. The area near the Site is underlain by the Pennsylvania-aged rocks in the Hance Formation of the Breathitt Group. The Site is in the valley of the Cumberland River, and alluvial deposits up to 30 feet thick lie above the bedrock. The upper bedrock unit in the area is the Cawood Sandstone Member of the Hance Formation. This sandstone unit grades laterally into siltstone and thin-bedded sandstone, and contains thin discontinuous coal seams. The base of the Cawood Sandstone occurs at 100 to 130 feet below the ground surface, and is underlain by a portion of the Hance Coal Zone that consists of four seams interbedded with sandstone, silty sandstone and shale. The principal coal seam is the Terry's Fork coal bed that occurs at the base of the Hance coal zone.

The Site is located on the Cumberland Mountain overthrust block, south-southeast of the Pine Mountain overthrust fault and north-northwest of the Cumberland Mountain within an east-west trending synclinal trough. To the north, the bedrock dips three to five degrees to the southeast. To the south, the bedrock dips one degree or less to the north-northwest. There are northwest-southeast trending faults in the area that are associated with the Pine Mountain Overthrust Fault.

A generalized stratigraphic column of the upper 400 feet encountered at the Site is presented in Figure 1.3.

#### 1.6 Hydrogeology

The Site is underlain by two significant water-bearing units. The uppermost, alluvial deposits consisting of well to poorly sorted accumulations of sand, silt, and clay occur at ground surface. The alluvial deposits are twenty-five to thirty feet thick in the vicinity of the Site. They generally contain ground water under unconfined conditions, at depths averaging twenty feet below existing land surface. Recharge occurs by rainfall infiltration. Shallow ground-water flow is generally directed eastward towards the Cumberland with respect to the facility.

The alluvium is underlain at a depth of thirty feet by Pennsylvanian-age sedimentary bedrock. The consolidated units of interest include(in descending order):

- . Cawood Sandstone - Sandstone grading laterally into siltstone and thin bedded sandstone with isolated coal seams.
- . Hance Formation - shale and siltstone underlain by coal seams interbedded with sandstone and shale.

Ground water occurs under generally confined conditions within the bedrock's secondary fractures and faults. The unit is recharged from places where it crops out, permitting rainfall infiltration from overlying hydrogeologic units in hydraulic connection. The bedrock unit's flow typically follows the river valley's axis to the southwest with respect to the Site. The bedrock unit is reported to be a reliable source of water. Study area bedrock wells range in depth from 58 to 639 feet below ground surface. The potentiometric surface in the bedrock aquifer is about twenty-four feet below grade at the Site. Because the alluvial water table is higher in elevation than the potentiometric surface of the bedrock unit, recharge from the overlying unit into the bedrock is likely.

#### 1.7 Surface Water

The Site is bounded on the east by the Cumberland River. The river flows from north to south and serves as a discharge point for drainage leaving the Site. The Harlan County Municipal water intake is located upstream of the Site at the Poor Fork Branch.

#### 1.8 Natural Resources

Ground water in the bedrock aquifer is used for drinking water and industrial uses in Harlan communities located in the Cumberland River valley downgradient of the Site. Before discovery of the VOC ground-water contamination in February 1989 more than

140 wells in the Dayhoit area were utilized for domestic purposes.

Coal is mined extensively in the Harlan County area and this industry is the primary employer for the county.

#### 1.9 Climatology

Temperature in this area averages at 56 F. Average annual rainfall is 50 inches, with net precipitation at 16 inches. The prevailing winds are from the northeast.

## 2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

### 2.1 Operational History

From 1951 to 1987 the National Electric Coil Co., (NEC) operated under the ownership of McGraw Edison Co. The business involved rewinding electric motors, manufacturing coils, and rebuilding machinery used in the coal mining industry. Cooper Industries purchased McGraw Edison in 1985 and continued operations until August 1987 when the facility was sold to Treen Land Company.

Past practices at the facility involved the use of a trichloroethylene (TCE)-based solvent to remove oil and tar from the used motors, capacitors, transformers, and other equipment prior to their being rebuilt. Before servicing, the equipment was, reportedly lowered for cleaning into an approximately 1,000-gallon tank containing the TCE-based solvent and located within a below-grade concrete pit. Periodically this tank was drained for cleaning, and the contained liquid and waste matter was allowed to flow overland and/or through a drainage pipe to the Cumberland River. PCB laden oil was also allowed to drain from transformers and other electrical equipment on site and/or flow through the drainage piping that led to the river. Sludges from the solvent tank as well as debris (coal ash) containing high concentrations of heavy metals from a furnace operated on site, were disposed of along the river. These disposal practices continued until the mid-1980's and have resulted in ground-water contamination of the local drinking water supply near the Site with the contaminant TCE and its degradation by-products. Contamination of the Site's drainage channels, river embankment property, and facility grounds also occurred.

Currently the Site is an active facility for rewinding and rebuilding electric motors and hydraulic systems used for the mining of coal. Equipment brought to the facility for refurbishment is now cleaned with a soap-based cleaner instead of the solvent based degreaser used by the National Electric Coil Company. The manufacturing facility currently operating on the Site, employs less than 20 workers.

In February 1989, the Kentucky Department of Environmental Protection, Division of Water, sampled the community well at the adjacent Holiday Mobile Home park as well as other surrounding residential wells. Analyses of the approximately fifty (50) samples indicated the presence of VOCs, in twelve of the wells. Users of the contaminated wells were provided with bottled water and water from temporary above ground storage tanks in March 1989, prior to the installation of municipal water lines to the affected areas. Residential groundwater users in the areas either already contaminated or at risk of future contamination were then connected to the Black Mountain Water District municipal water system in August 1989. Funding for construction of a water line extension was provided by Cooper Industries. There are reports that some residents do not utilize the public water system. Reasons cited include both perceived poor water quality and cost of services.

### 2.2 Enforcement Summary

In October 1990, EPA issued a Unilateral Administrative Order (Order) to Potentially Responsible Parties (PRPs), McGraw-Edison Co./Cooper Industries, Inc., Treen Land Co., and National Electric Service Co., to conduct an early action removal of contaminated soils located on site. McGrawEdison Co./Cooper Industries, Inc., undertook the site Removal Action activities with the approval of current site property owner and lessee, Treen Land Co., and lessor, National Electric Service Co. Approximately 5.100 tons of soil were excavated for off-site disposal during these Removal Action activities. These contaminated areas were excavated for off-site disposal during the Removal Actions conducted under EPA supervision from October 1990 through October 1991. On March 19, 1992, EPA notified McGraw-Edison Co./Cooper Industries, Inc., of the Agency's determination that all activities outlined in the Order had been completed.

The site RI/FS and associated site studies will be conducted under the Administrative Order by Consent that McGraw Edison/Cooper Industries, Inc., signed with the Agency in May 1992. EPA will oversee all RI/FS and related site studies activities to be performed by Cooper Industries to ensure compliance with all applicable laws and regulations and to ensure that the work proceeds in a timely fashion.

The National Electric Coil Co./Cooper Industries Site was proposed for inclusion on the National Priority List (NPL), as defined in Section 105 of CERCLA, as amended, 42 U.S.C. 9605, on July 29, 1991. Finalization of this Site on the NPL has not occurred at this time.

### **3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION**

The Proposed Plan for "interim" action at the National Electric Coil Co./Cooper Industries Site was presented at the public meeting held on July 28, 1992 at the Harlan County Courthouse. This document was made available to the public in the information repository maintained at the EPA Docket Room in Region IV, the Harlan County Public Library, and at the Southeast County Community College Library. Notice of availability of this document and notice of the public meeting was published in the Harlan Daily Enterprise on July 15, 1992. The Public Comment Period was held from July 15, 1992 through August 14, 1992.

At the public meeting, representatives from EPA answered questions regarding the rationale for initiating site remediation as an "interim" action ROD prior to thorough site characterization, by means of an RI/FS, and also on perceived site-related health problems. A response to comments received during this period and to questions not answered at the public meeting is included in the Responsiveness Summary, which is part of this Record of Decision. This decision document presents the selected "interim" remedial action for the Site, chosen in accordance with CERCLA, as amended by SARA and, to the extent practicable, the National Contingency Plan (NCP). The decision for this site is based on the administrative record.

At the completion of the RI/FS, EPA will develop another proposed plan which will describe the final remedy and the process used to select that remedy. The proposed plan will be mailed to interested parties and all persons who have requested to be included on EPA's mailing list for the Site. EPA will conduct a 30-day public comment period on the FS Report and the proposed plan to provide an opportunity for public involvement in the final cleanup decision.

After the public comment period and the public meeting, EPA will again review and consider all comments received from the community as part of the process of reaching a final decision on the most appropriate remedial alternative, or combination of alternatives, to address contamination found at the NEC site. EPA's final choice of a remedy will be documented in a ROD, which will include the responsiveness summary.

### **4.0 SCOPE AND ROLE OF RESPONSE ACTION WITHIN SITE STRATEGY**

The "interim" remedial action involves the use of a ground-water extraction well to pump the VOC contaminated bedrock aquifer beneath the Site in order to restrict further contaminant plume migration from the Site while bedrock aquifer characterization is being conducted under a remedial investigation/feasibility study (RI/FS). The bedrock aquifer addressed in this "interim" action is used as a drinking water source, while the shallow aquifer beneath the Site is not and will be addressed in the final remedy. This "interim" action does not constitute a final remedial action for this site. Upon completion of the RI/FS, the ground-water treatment system embodied by this "interim" remedial action may be incorporated into the Site remedy design specified in the final action ROD. It is EPA's intent to install a comprehensive extraction well system to address the site's ground-water contamination as part of a final action for site clean-up once the RI/FS has been completed. An RI/FS typically takes from 18 to

24 months to complete. Once completed, the remedial design of this remedy will commence in which engineering drawings and specifications will be developed. The remedial design phase typically requires approximately 18 months.

Due to the length of time required to complete the RI/FS and post RI/FS activities. EPA has elected to initiate groundwater cleanup activities at this time. This "interim" remedial action will contain the volatile organic compound (VOC) contaminant groundwater plume through pumping to reverse the hydraulic gradient of the plume migrating from the Site. This "interim" remedial action will be monitored carefully to determine the feasibility of achieving the goal of bedrock aquifer restoration by employing hydraulic control methods on the contaminant plume.

## **5.0 SUMMARY OF SITE CHARACTERISTICS**

### **5.1 Nature and Extent of Contamination Overview**

A remedial investigation has not been conducted at the NEC site, so data collected during previous site investigations serve as a basis for the Agency's current characterization of site media contamination. These previous investigations include numerous Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC), EPA, and PRP on-site and off-site residential ground-water wells sampling events conducted since February 1989, the site assessment conducted for purposes of NPL ranking, site aquifer pump testing, and contaminated site soil Removal Action activities. These investigations indicated the presence of hazardous substances handled and/or disposed of at the Site as well as their degradation products in site soils and sediment adjacent to the Site and the shallow overburden ground-water beneath the Site. Extensive VOC contamination was detected in the deep bedrock aquifer ground water onsite and downgradient of the Site. Sampling of site environmental media indicated the presence of the following three groups of hazardous substances CERCLA 101: (1) volatile organic compounds (VOCs), namely trichloroethene, cis-1,2-dichloroethene, vinyl chloride, benzene, toluene, and ethylbenzene: (2) polychlorinated biphenyls (PCBs); and (3) metals, namely, lead and chromium.

### **5.2 Deep (Bedrock) Aquifer**

Bedrock aquifer ground water located beneath the Site and downgradient of the Site flows through the upper unit of the Hance Formation. Production wells and residential wells in the area are generally cased through the shallow coal seams and are constructed (open borehole) in bedrock comprised of sandstone, then siltstone/shale, then siltstone with increasing depth. Pump tests conducted on study wells constructed here indicate that ground-water migration is fracture flow dominated and flows in a southwesterly direction downgradient of the Site. Ground-water flow in the bedrock is not influenced by the directional flow of the Cumberland. The aquifer is contaminated with TCE and its degradation products, primarily cis-1,2-DCE and vinyl chloride. These contaminants are dense nonaqueous phase liquids (DNAPLs) and their fate and transport will be investigated more fully as part of the RI/FS. Vinyl chloride has been detected as high as 350 ug/l and cis-1,2-DCE as high as 905 ug/l in off-site private wells. The Maximum Contaminant Levels (MCLs) for these contaminants are 2 ug/l and 70 ug/l, respectively.

The VOC contaminant plume extends approximately one-half mile downgradient of the site. This lateral plume delineation is based on analytical samples collected from approximately 100 on-site and off-site private wells screened within the bedrock aquifer. Table 5.1 provides a summary of ground-water data collected to date at the site and in nearby areas. The depth of VOC contamination in the bedrock aquifer has not yet been defined. The former Holiday Trailer Court community well, at 356 feet, is the deepest contaminated offsite well from which ground-water samples have been collected. This well, however, is only cased through the overburden and is constructed in 200 feet of open borehole. Therefore, the exact depth to which VOC contamination extends in the fractured bedrock is not known. Figure 5.1 depicts the

estimated extent of the contamination plume identified in the RI. This "interim" action will initiate remediation of the bedrock aquifer.

### 5.3 Overburden Soils

The Removal Action activities were conducted to delineate the areal extent of source contaminated site soils in the overburden and to excavate these soils. Analytical results of the samples collected in conjunction with the Removal Action and other site assessment investigations showed site soils to be contaminated with VOCs, PCBs, and metals. Contaminated soils and debris, totaling approximately 5,100 tons, were excavated for off-site disposal from five principle areas: (1) the rear of the property along the bank of the Cumberland River where fill material was located; (2) an outfall area, also located along the river, at rear of the property where two drainage pipes leading from the plant discharged; (3) an isolated area along the south fence line and adjacent to the trailer park; (4) an isolated area where equipment and drums were stored; and (5) the removal of two drainage lines leading from the plant. The action levels that dictated removal were (1) 10 mg/kg PCBs; (2) 10 mg/kg total VOCs; (3) 5 mg/l TCLP lead; and 5 mg/l TCLP chromium, and (4) 100 mg/kg total lead and chromium. The areas where soils were excavated are shown in Figure 5.2.

The overburden soils formation is approximately 30 feet in depth. Final characterization of contamination in these alluvial soils will be completed during the Site RI/FS.

### 5.4 Shallow (Overburden) Aquifer

Samples collected on site from the overburden aquifer indicate that the shallow aquifer is contaminated with metals and VOCs that are both TCE related and gasoline degradation compounds. No PCBs were detected. The maximum VOC concentrations of the significant contaminants, cis-1,2-DCE, TCE, vinyl chloride, and benzene, were 3700 ug/l, 17,000 ug/l, 77 ug/l, and 19,000 ug/l, respectively. Lead and chromium were detected at 127 ug/l and 594 ug/l, respectively.

Current characterization of this aquifer is based on the five wells installed in the overburden aquifer during the preliminary site assessment activities on sites. Pump tests performed on these wells indicate that this aquifer discharges into the Cumberland River. Remediation of this aquifer will be addressed once the Site RI/FS has been completed and a final remedy has been selected.

## 6.0 SUMMARY OF SITE RISKS

A formal baseline risk assessment has not yet been prepared for the NEC site, but will be conducted during the RI/FS. The Agency's decision to initiate an "interim" remedial action at this site is based on data collected during previous site investigations which indicate that hazardous substance releases from this site are migrating through the bedrock aquifer. The contaminants of concern have that been identified to date are presented in Table 6.1. This "interim" remedial action will be conducted in order to reduce VOC plume migration from the Site and, to the extent practicable, prevent further ground-water quality degradation.

Concentrations in off-site residential wells, completed in the bedrock aquifer, for vinyl chloride have been observed as high as 350 ug/l and for cis-1,2-DCE as high as 905 ug/l. The Maximum Concentration Limits (MCLs) for these contaminants in drinking water are 2.0 ug/l and 70.0 ug/l, respectively. Because the final site remediation may not begin for another four years, the Agency has decided that containment of this plume by pumping measures will reduce the spread the VOC plume through the bedrock aquifer during this period. Thus, the establishment of new exposure pathways to contaminated ground water at additional well points will be minimized, to the extent practicable.

For an unspecified period of time prior to the discovery of groundwater contamination, residents and workers in the Dayhoit area were exposed to VOC contaminated ground water obtained from domestic and industrial wells completed within the bedrock aquifer. Fifteen residential wells in the Dayhoit community, the Holiday Mobile Home Park communal well and an on-site drinking water well for workers are known to have been contaminated. Municipal water lines have been extended to residences beyond the known affected areas.

Analytical results of the samples collected prior to the Removal Action site soil excavations and in conjunction with other site assessment investigations showed site soils to be contaminated with VOCs, PCBs, and metals and that ground-water samples collected both on and off site contained VOC concentrations above health based levels. Table 6.1 displays a listing of the contaminants of concern and are grouped by media.

Removal of these contaminated source soils located on the Cumberland River bank and waste areas has reduced site risks to humans by eliminating exposure routes by which direct dermal contact with and ingestion of these contaminants might occur and removed potential sources of continuing ground-water contamination. During the Removal Action contaminated soils and debris, totaling 5,100 tons, were excavated for off-site disposal.

Data that is to be collected during the RI and data already collected in previous investigations under EPA supervision will be evaluated in order to assess the current and future risks posed by the Site. This data will be compiled for evaluation in the baseline risk assessment.

## **7.0 DESCRIPTION OF REMEDIAL ALTERNATIVES**

The following alternatives were evaluated by EPA using the nine evaluation criteria.

1. No Action;
2. Contaminated Ground-Water Extraction Using On-site Well; Air Stripping of Contaminated Water; Discharge of Remediated Ground-water; and Emission Control of the Resulting Air And VOC Vapor Stream

### **7.1 Alternative 1: No Action**

The Agency requires that this alternative be evaluated at every site to serve as a baseline for comparison for all other alternatives considered. Under this alternative. EPA would take no action at the Site at this time to minimize further migration of contaminated ground water from the Site while the RI/FS is being conducted.

This alternative would not require any expenditures, and no time for implementation.

### **7.2 Alternative 2: On-site Well Contaminated Ground-Water**

Containment/Extraction; Air Stripping of Contaminated Water; Discharge of Remediated Ground Water to Cumberland River; and Emission Controls on the Resulting Air/VOC Vapor Stream

This alternative will ensure that active treatment and containment of the contaminated ground-water plume, migrating from the Site, will begin during the conduct of the RI/FS. Ground water containing VOCs will be extracted at a rate of approximately 100 gallons per minute and will be pumped from an on-site 120-foot well completed in the bedrock aquifer for treatment in an air stripper tower. A supplemental on-site extraction well may be utilized to allow flexibility in the ground-water treatment system. The area of attainment extends downgradient from the Site, in a southwesterly direction, for approximately 3300 feet.

Air stripping will remove approximately 99 percent of the VOCs contained in the extracted ground water. The resulting vapors, stripped from the ground water, will be captured in an adjoined emissions control unit. Treated ground water exiting the air stripper tower will be released to the Cumberland River in compliance with State of Kentucky Pollutant Discharge Elimination System (KPDES) requirements before discharge to the Cumberland River. State requirements for ground-water discharge, ground-water withdrawal, and applicable State air emission regulations will be observed as ARARs at this site.

In order to assess the performance of the ground-water extraction system an extensive monitoring and sampling program will be initiated prior to the start up of the system and during its operational period. Approximately thirty-three ground-water wells located in the assumed path of the VOC plume in the Dayhoit, Fresh Meadows, Wallins Creek, and Tremont communities will be utilized in this program. Selected ground-water wells located in the hydraulically upgradient community of Keith will also be monitored. Samples will be collected from approximately twenty-four of these wells for chemical analysis prior to the start-up of the system and at established intervals thereafter.

The extraction well and air stripper tower are already in place on site, so no capital expenditure will be required for construction. The cost of this system was approximately \$106,000. Annual operating costs for the system have been estimated to be \$150,000 per year. Implementation of this alternative will be initiated once the baseline monitoring sampling event has been completed.

#### Residuals

Contaminated wastes generated from "interim" remedial action activities involving treatment of TCE would be handled as a listed F001 coded solid waste and in compliance with all applicable Land Disposal Restrictions (LDRs).

### **8.0 SUMMARY OF COMPARATIVE ANALYSIS ALTERNATIVES**

This section profiles the Preferred Alternative against the nine criteria, noting how it compares to the "No Action" alternative for the relevant evaluation criteria. The nine criteria are categorized into three groups: threshold criteria, primary balancing criteria and modifying criteria. The threshold criteria must be satisfied in order for an alternative to be eligible for selection. The primary balancing criteria are used to weigh major tradeoffs among alternatives. Generally, the modifying criteria are taken into account after public comment is received on the Proposed Plan. The evaluation follows.

#### THRESHOLD CRITERIA

Overall Protection addresses whether or not a remedy provides adequate protection and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

The ground-water extraction well/air stripper system, presented as Alternative 2, provides protection of human health and the environment because it will initiate a reduction in risks from future exposure to contaminants in ground water. The ground-water containment aspect of this alternative provides environmental protection by mitigating, to the extent practicable, the spread of the ground-water plume through the bedrock aquifer, thus, reducing the volume of contaminated ground water that will require restoration. Containment of the plume will reduce the chances that new exposure pathways to the bedrock aquifer will be established at more well points.

The "No-Action" alternative provides protection to neither human health nor the environment because it does not address the continued migration of VOC contaminants from the Site. Thus the "No-Action" alternative would neither arrest the continued ground-water plume migration nor initiate the reduction of site contaminants and the potential risk these contaminants pose to human health and the environment via continued ground-water degradation.

Compliance with ARARs addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of other environmental statutes and/or provide grounds for invoking a waiver. The ARARs identified for this "interim action are listed in section 10.2.

The air stripper tower will treat site ground water from the bedrock aquifer to meet all Federal and State of Kentucky water quality standards for discharge to the Cumberland River. Treated water will be released to the Cumberland River, only, in compliance with KPDES. Additionally, air emissions leaving the air stripper system will meet the Federal and State of Kentucky air emissions standards. Ground-water withdrawal rates will not exceed those set by State regulations.

LDRs are applicable because treatment residuals resulting from the remediation of ground water containing the F001 listed waste, TCE, is considered a listed RCRA solid waste. All manifesting and generator requirements cited in CFR 262 and 268 will be met during this CERCLA response action.

The final cleanup levels for the ground water are not addressed in this "interim" remedy because such goals are beyond the limited scope of this action. The final cleanup levels will be addressed by the final remedial action ROD for the Site.

#### PRIMARY BALANCING CRITERIA

Long-Term Effectiveness and Permanence refers to the ability to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

The goal of this "interim" remedial action is short term in scope in that its purpose is to prevent the spread of contaminants in the underlying bedrock aquifer while the RI/FS and post-RI/FS activities are being completed. Still, Alternative 2 is consistent with the Agency's long term goal of returning ground water to its beneficial uses because contaminants are permanently removed as the bedrock aquifer is pumped in attempt to hydraulically control ground-water plume's migration from the Site. Data will be collected during this "interim" remedial action to evaluate the bedrock aquifer's response to pumping in terms of hydraulic control and contaminant concentration reduction. This information will be utilized in conjunction with that collected during the RI to develop alternatives for a final remedy selection. Long-term effectiveness and permanence will be more thoroughly evaluated at that time.

Reduction of Toxicity, Mobility, or Volume of the Contaminants Through Treatment is the anticipated performance of the treatment technologies a remedy may employ.

The ground-water extraction well/air stripper system will reduce the toxicity, mobility, and volume of VOC contaminants extracted from the bedrock aquifer by air stripping or dispersing VOCs dissolved in ground water and by capturing the resulting vapors through emission controls. The air stripper tower will effectively remove more than 99% of the VOCs contained in the ground water. Air containing vapor 'stripped' from contaminated water will be blown through to a subsequent emission control unit prior to being released to the atmosphere.

Short-Term Effectiveness addresses the period of time needed to achieve protection from any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

Projected emissions from VOCs stripped from contaminated ground water are below those levels that will cause any adverse health effects. The Agency has developed health based VOC emission limits for which the system will be monitored in the event that ground-water contaminant concentrations increase significantly once "interim" action ground-water pumping activities are underway. Currently, the air stripper tower has been fitted with a granulated activated carbon (GAC) unit to control VOC vapors. Additional GAC units or other emission controls will be added as necessary to meet the Agency's health based emission levels.

No adverse health impacts on human health and the environment are anticipated as the result of construction activities because the extraction well/air stripper system is already in place on site.

It is anticipated that the duration of the "interim" remedial action activities should not exceed four years. At the conclusion of the RI/FS the Agency will propose the final remedial actions under which the remaining site contamination will be fully addressed.

Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

The ground-water extraction/air stripper system has already been constructed on site. Ground-water wells comprising the monitoring well system, which will be monitored during the system's operational period, have already been mutually identified by EPA, the State, and Cooper Industries.

#### Cost

The estimated operational cost for the ground-water extraction/air stripper system is estimated to be \$150,000 per year. The initial cost for design and construction of the system was \$105,500.

#### MODIFYING CRITERIA

##### State Acceptance

The Commonwealth of Kentucky granted its concurrence with this "interim" remedial action in a letter dated September 18, 1992. The terms of this concurrence were as follows: (1) continuous monitoring of effluent vapors during the initial phase of the extraction well/air stripper system operation; (2) assurance that quantitation limits do not exceed the corresponding maximum contaminant level for ground water contaminants of concern; (3) request that additional wells in the Wallins Creek area be analyzed for site contaminants of concern; and (4) compliance with Kentucky Pollutant Discharge Elimination System requirements developed for this "interim" remedial action.

##### Community Acceptance

The Agency received ninety-eight comments and/or letters during the Comment Period. Also a petition, containing 141 signatures, was submitted by the Concerned Citizens Against Toxic Waste in opposition to the tenets of this ROD. The Public Comment Period was held from July 15, 1992 through August 14, 1992. No extension to the comment period was requested.

Written comments to EPA in response to the Proposed Plan by community residents and those read into the record at the Public meeting, held on July 17, 1992, expressed the public's strong opposition to EPA's plan to initiate "interim" remedial actions at the Site.

In general, three issues were presented by the community: (1) The "interim" remedial action will begin before the Site has been characterized; (2) heavy metals and other site contaminants would be released to the Cumberland River; and (3) air toxics will be released from the air stripper tower.

## **9.0 THE SELECTED REMEDY**

Based upon consideration of the requirements of CERCLA, the National Contingency Plan, the detailed analysis of alternatives and public and state comment. EPA has selected a ground-water remedy for this site. The Selected Remedy, Alternative 2, involves the use of a ground-water extraction system consisting of an extraction well and a countercurrent air/water air stripper tower to hydraulically reduce, to the extent practicable, the migration of the ground-water plume that extends approximately one-half mile from the Site within the bedrock aquifer located in the Site's subsurface. Alternative 2 calls for the implementation of an "interim" remedial action to protect human health and the environment.

As stated the goal of this "interim" remedial action is to halt the spread of the bedrock contaminant plume and to collect data on aquifer and contaminant response to remedial measures. The ultimate goal of remediation, to be determined in a final remedial action for this site, is to return the ground water to its beneficial uses, in this case, for drinking water purposes. This remedial action will be monitored carefully to determine the feasibility of achieving this goal with this method and to ensure that hydraulic control of the VOC contaminant plume is maintained. After completion of the RI/FS in accordance with the NCP, EPA will arrive at a final remedial decision for the Site, and will issue a final ROD for ground water, which will specify the ultimate goal, remedy, and anticipated remediation timeframe. Upon completion of the RI/FS, this "interim" system may be incorporated into the design of the Site remedy specified in the final action ROD.

### **9.1 Major Components of the "Interim" Remedial Action**

Ground-water remediation will address the contaminated ground water at the Site. Contaminated ground-water will be extracted from an approximately 120 foot well completed in the bedrock aquifer. Recovered ground water shall be treated in an on-site treatment system. Ground water will be pumped to the top of the packed air stripper tower where it will flow downward. Air is simultaneously blown from the bottom of the tower, countercurrently and upwardly through packing material. The agitation created by air, water, and tower packing material contact causes volatilization (stripping) of VOCs dissolved in the ground water. These contaminants have high vapor pressures and they partition preferentially from the aqueous phase to a gaseous one. Volatilized vapors are carried away in the air stream. The air stream, containing VOC vapors, exits the tower and passes through the attached carbon bed unit. As the air stream passes through the unit, VOC vapors are adsorbed in the emission control unit. The remediated ground water will be discharged to the Cumberland River.

The effectiveness of the extraction well in reducing VOC concentrations in the bedrock aquifer and its ability to arrest the migration of the plume will be evaluated through an extensive monitoring program. The proposed monitoring program is comprised of thirty-three residential, production, and monitoring wells that will be sampled during the RI. Potentiometric changes and changes in plume contaminant levels will be observed throughout the extraction well's operational period. Analytical samples will be collected from approximately twenty-four wells. A baseline sampling event to record groundwater quality and level at each of the wells will be conducted before start-up of the extraction well system.

The Selected Remedy enables EPA to initiate cleanup of the VOC contaminated ground-water aquifer, while the RI/FS and related activities are being completed. Further ground-water degradation as the result of contaminant migration will be reduced. Further, the Selected Remedy will be used to monitor the hydrologic regime at the Site and effectively evaluate operation and impact of the on-site ground-water extraction well.

## 9.2 Performance Standards

### Air Emissions and Ground Level Concentration Standards

Projected VOC emissions stripped from contaminated ground water are below those levels that will cause any adverse health effects. The Agency has developed health-based vinyl chloride, TCE, and cis-1,2-DCE emission limits for which the system will be monitored in the event that ground-water contaminant concentrations increase significantly once "interim" action groundwater pumping activities are underway. These emission limits shall serve as performance standards for this ROD and are presented in Table 9.1. The point of compliance for these emission levels shall be the stack pipe exit point from which emissions are released to the air. Currently, the air stripper tower has been fitted with a granulated activated carbon (GAC) unit to control VOC vapors. Additional GAC units or other emission controls, such as a thermal destruction unit, will be added as necessary to meet the Agency's health based emission levels. Air emissions from the stripper will be monitored on a regular schedule by EPA to ensure that any emissions exceeding the prescribed levels will be detected.

Ambient air monitoring shall also be performed on the Holiday Trailer Park located next to the site facility. The fenceline separating the Site from the Holiday Trailer Park property shall serve as the point of compliance. Ground level concentrations that shall serve as performance standards are presented in Table 9.1.

### Treated Ground Water Discharge Standards

Treated ground water, exiting the tower, will be discharged to the Cumberland River in compliance with the applicable KPDES requirements. KPDES discharge limits will serve as performance standards for this ROD. They are presented in Table 2.

### System Design Standards

The operating parameters under which the ground-water extraction/air stripper system shall operate are contained in Table 9.3.

### ARAR Requirements

The following major ARARs shall be met for the ground-water contaminants of concern for this "interim" action.

Treated ground water discharged to the Cumberland River shall comply with applicable KPDES limits. State ground-water withdrawal requirements shall be observed.

Certain RCRA regulations are applicable, specifically, LDRs. Solid wastes resulting from the treatment of F001 ground water will be generated (i.e. spent GAC from air pollution controls) and shall be handled as F001 listed RCRA solid waste until decontaminated. Applicable manifest and generator requirements as cited in CFR 262 and 268 shall be met during this CERCLA response action.

#### Compliance Monitoring

Air emissions and ground water exiting the air stripper tower and ground level ambient concentrations shall be monitored at this site in order to demonstrate compliance with Performance Standards. If monitoring indicates an exceedence of the Performance Standards set forth in Table 9.1 and Table 9.2, pumping shall cease.

Should pumping activities cease as a result of an exceedence of Performance Standards EPA shall determine what additional control measures are needed in order to achieve these Performance Standards. Pumping activities shall resume upon implementation of this determination.

### **10.0 STATUTORY DETERMINATION**

#### 10.1 Protection of Human Health and the Environment

This "interim" remedial action protects human health and the environment from exposure to bedrock aquifer contaminants. The ground-water extraction well/air stripper system, presented as Alternative 2, provides protection of human health and the environment because it will initiate a reduction in risks from future exposure to contaminants in ground water. The ground-water containment aspect of this alternative provides environmental protection by mitigating to the extent practicable further spread of the ground-water plume, thus, reducing the volume of contaminated ground water that will require restoration. Containment of the plume will reduce the chances that new exposure pathways to the bedrock aquifer will be established at more well points.

#### 10.2 Compliance with ARARs

Alternative 2 attains all of the requirements that have been identified as applicable or relevant and appropriate to actions that will occur as the result of implementation of the selected remedial action. The following are major applicable or relevant and appropriate requirements (ARARs), riskbased levels and other "to be considereds" (TBCs) being met/utilized for the specific components of the remedial action.

Chemical-Specific ARARs are health or risk-based concentration limits or ranges in various environmental media for specific hazardous substances, pollutants, or contaminants. These ARARs set protective cleanup levels for the contaminants of concern in the designated media or indicate an acceptable level of discharge into a particular medium during a remedial activity.

401 KAR 63:022 is applicable to this response action because it regulates facilities which emit the toxic air pollutants, specifically cis-1,2-Dichloroethene.

Location Specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they are in specific locations.

40 CFR 264.18(b). Floodplain Management, mandates that hazardous waste treatment, storage or disposal facilities located within a 100-year floodplain must be designed, constructed, operated and maintained to avoid washout. This regulation is applicable because the Site is located within the 100-year floodplain of the Cumberland River. 40 CFR 6.302. Fish & Wildlife Coordination Act, requires adequate protection of fish and wildlife if any stream or other body of water is modified. Additionally, actions in floodplains are required to avoid adverse effects, minimize potential harm, and restore and preserve natural and beneficial values.

Action Specific ARARs are performance, design, or other similar action-specific requirements that impacts particular remedial activities. These requirements are triggered by the particular remedial activities that are selected to accomplish a remedy. These requirements do not determine the remedial alternative, but, they do indicate how a selected alternative must be achieved.

Resource Conservation Recovery Act (RCRA) (42 U.S.C. 6921-39 (300119); 40 CFR Parts 260-270) regulates the treatment, storage, and disposal of hazardous waste from generation through ultimate disposal. RCRA applicable requirements may include LDR and waste generator requirements set forth at 40 CFR Part 268.7 and Part 262. Any offsite facility receiving the hazardous waste for disposal will meet the requirements set forth in 268.41.

Because the Commonwealth of Kentucky may be authorized for some or all of the RCRA provisions, the applicable regulations are hereby incorporated by reference.

Kentucky Pollutant Discharge Elimination System (401 KAR 5, specifically Parts 031, 065, and 075), Kentucky Water Quality Regulations is applicable to this response action because it regulates the point-source discharge of treated ground water to the Cumberland River by setting discharge limitations and monitoring requirements. This response action shall abide by the substantive requirements these regulations set by the Commonwealth of Kentucky, which has been authorized to implement the National Pollutant Discharge Elimination System program under authority of the Clean Water Act (CWA) 402. Section 402 of the CWA incorporates sections 301, 302, 306, and 307. KRS 151.140 is applicable to this response action because it regulates the withdrawal of water from public waters within the Commonwealth of Kentucky. This response action will comply with all substantiative requirements of this regulation.

To Be Considereds (TBCs) are non-promulgated advisories or guidance issued by Federal or State government that are not legally binding and do not have the status of potential ARARs. However, as described below, in many circumstances TBCs will be considered along with ARARs as part of the site risk assessment and may be used in determining the necessary level of cleanup for protection of health or the environment.

Estimation of Air Impacts for Air Stripping of Contaminated Water (EPA-450/1-91-002) Air/Superfund National Technical Guidance Series May 1991. This guidance outlines the procedure under which air emission limits for this response action were derived.

### 10.3 Cost-Effectiveness

Alternative 2 utilizes an extraction well/air stripper system already in place on site. The extraction well used in this system is a former production well. The cost of the air-stripper tower was approximately \$106,000. Yearly operational costs for this system are estimated at \$150,000 per annum.

### 10.4 Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

This "interim" remedial action does not constitute a final action for remediation of the shallow and bedrock aquifer ground water. It will, however, be effective in reducing the toxicity, mobility, and volume of VOC contaminants extracted from the bedrock aquifer by air stripping VOCs dissolved in ground water and by capturing the resulting vapors through emission control. Selection of this remedy represents the best balance of tradeoffs with respect to pertinent criteria, given the limited scope of the action.

### 10.5 Preference for Treatment as a Principal Element

The Selected Remedy utilizes air-stripping as a means of treatment of the VOC contaminated bedrock ground water found at the Site. The statutory preference for treatment will also be applied to the contaminated site media not addressed in this "interim" remedial action as part of final response action.